

ABSTRAK

GAME EDUKASI METAMORFOSIS HEWAN BERBASIS ANDROID SEBAGAI MEDIA PEMBELAJARAN DI SDN 41 PALEMBANG

(Meliza, 2026, 185)

Materi metamorfosis hewan memerlukan visualisasi yang jelas karena membahas tahapan perubahan bentuk hewan secara bertahap. Oleh karena itu, pemanfaatan teknologi seperti *game* sebagai media pembelajaran pendukung dapat menjadi alternatif untuk menyajikan materi secara lebih interaktif dan menarik. Penelitian ini bertujuan mengembangkan *game* edukasi metamorfosis hewan berbasis Android sebagai media pembelajaran bagi siswa kelas III SD Negeri 41 Palembang. Pengembangan *game* menggunakan metode *Game Development Life Cycle* (GDLC) yang terdiri dari tahap inisiasi, pra-produksi, produksi, pengujian internal, dan rilis. Selain itu, algoritma *Finite State Machine* (FSM) diterapkan pada NPC musuh untuk mengatur perilaku karakter melalui *state Patrol*, *Chase*, *Attack*, dan *Recall*. Hasil pengujian fungsional, *control player test*, dan *gameplay test* menunjukkan seluruh fitur *game* berjalan sesuai dengan rancangan. Pengujian FSM memperoleh tingkat keberhasilan sebesar 100% yang termasuk kategori sangat baik. Hasil pengujian performa sistem menggunakan Unity Profiler menunjukkan bahwa *game* memiliki rata-rata *frame rate* sebesar 115,26 FPS, penggunaan CPU sebesar 9,04 ms, dan penggunaan memori (RAM) sebesar 1,18 GB tanpa mengalami lag maupun *freeze* selama pengujian. Hasil evaluasi pembelajaran menunjukkan rata-rata nilai *pre-test* siswa sebesar 50,77 meningkat menjadi 89,85 pada *post-test* dengan rata-rata N-Gain sebesar 0,85 atau 85% yang termasuk kategori tinggi. Dengan demikian, *game* edukasi metamorfosis hewan berbasis Android yang dikembangkan dinilai efektif dan layak digunakan sebagai media pembelajaran untuk membantu meningkatkan pemahaman siswa pada materi metamorfosis hewan di SD Negeri 41 Palembang.

Kata Kunci : *Game* Edukasi, Metamorfosis Hewan, Android, *Game Development Life Cycle*, *Finite State Machine*, N-Gain.

ABSTRACT

AN ANDROID-BASED ANIMAL METAMORPHOSIS EDUCATIONAL GAME AS A LEARNING MEDIUM AT SDN 41 PALEMBANG

(Meliza, 2026, 185)

The topic of animal metamorphosis requires clear visualization because it explains the gradual stages of changes in an animal's life cycle. Therefore, the use of technology, such as educational games, can serve as an alternative learning medium to present the material in a more interactive and engaging way. This study aims to develop an Android-based educational game on animal metamorphosis as a learning medium for third-grade students at SD Negeri 41 Palembang. The game was developed using the Game Development Life Cycle (GDLC) method, which consists of the initiation, pre-production, production, testing, and release stages. In addition, the Finite State Machine (FSM) algorithm was implemented to control the behavior of enemy NPCs through the Patrol, Chase, Attack, and Recall states. The results of the functional testing, control player testing, and gameplay testing showed that all game features functioned according to the design. The FSM testing achieved a success rate of 100%, which is categorized as very good. The system performance testing using Unity Profiler showed that the game achieved an average frame rate of 115.26 FPS, CPU usage of 9.04 ms, and memory (RAM) usage of 1.18 GB without experiencing lag or freezing during testing. The learning evaluation results showed that the average pre-test score of the students increased from 50.77 to 89.85 in the post-test, with an average N-Gain score of 0.85 (85%), which is classified as high. Therefore, the developed Android-based educational game on animal metamorphosis is considered effective and suitable as a learning medium to improve students' understanding of animal metamorphosis for third-grade students at SD Negeri 41 Palembang.

Keywords: *Educational Game, Animal Metamorphosis, Android, Game Development Life Cycle, Finite State Machine, N-Gain.*